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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,756	01/28/2004	Masanobu Sato	P/2699-32	5571
2352 7590 04/01/2009 OSTROLENK FABER GERB & SOFFEN 1180 AVENUE OF THE AMERICAS NEW YORK, NY 100368403				
EXAMINER				
BLAN, NICOLE R				
ART UNIT		PAPER NUMBER		
1792				
MAIL DATE		DELIVERY MODE		
04/01/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/767,756

**Applicant(s)**

SATO ET AL.

**Examiner**

NICOLE BLAN

**Art Unit**

1792

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 3, 4 and 25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4 and 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-85/86)  
Paper No(s)/Mail Date 11212008, 02042009
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 27, 2009 has been entered. The amendment to claim 1, the cancellation of claims 18 and 20-24 as well as the addition of claim 25 in the response filed January 27, 2009 is acknowledged. Claims 1, 3, 4 and 25 are pending.

### ***Response to Arguments***

2. Applicant's arguments filed January 27, 2009 have been fully considered but they are not persuasive.

3. In response to applicant's arguments regarding the use of Kanno and the combination of Kanno and Izumi, the Examiner does not find them persuasive. Kanno teaches a bi-fluid nozzle with a casing in Figure 12 [(32) which is the area between references (c) and (d)] upon which the droplets are formed outside of casing (32) to the left of reference (c). The claims as currently amended are not limited to prevent interaction of the liquid and the gas before they leave the nozzle. They only state that the droplets form outside of the casing. Regarding Kanno, the casing is the area marked by (32) between references (c) and (d). There is no specific structure defining what represents the casing. Therefore, the nozzle as claimed by Kanno meets the claimed limitations.

The Examiner appreciates applicant's argument regarding the difference between the figures of Kanno and those of the applicant's, but Kanno still reads on the current claim limitations. Therefore, the droplet size would be the same. Furthermore, applicant's argument pertaining to the specific structure of the nozzle casing is not found persuasive for the reason that none of the claims have ever recited such a distinction. Therefore, applicant's arguments are more specific than the claims. It is noted that the features upon which applicant relies are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**7. Claims 1 and 3-4 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kanno et al. (U.S. Patent 5,918,817).**

Claims 1 and 3-4: Kanno teaches a method of treating a semiconductor substrate [col. 1, lines 8-15]. The method of Kanno comprises generating droplets of a treatment liquid by mixing the treatment liquid with a gas [col. 7, lines 3-14], wherein the particle size of the droplet is about 10  $\mu\text{m}$  [reads on “volume median diameter” and on the range claimed in claim 1; col. 14, lines 22-30]; impinging the droplets on a surface of the substrate [col. 1, lines 8-15; col. 4, lines 20-24; col. 7, lines 3-14]. With regard to claims 3 and 4, since Kanno teaches supplying the treatment liquid at a flow rate of about 100 ml/min [col. 9, lines 37-45; col. 10, lines 45-48], which is identical to the flow rate of claim 4, since Kanno teaches the droplet size of about 10  $\mu\text{m}$  [col. 14, lines 22-30], which is within the instantly claimed ranges, the flow rate of the gas for generating such droplets would inherently be within the range as per claim 3.

Kanno teaches a substrate treatment method as set forth in claim 1, wherein the droplet generating step includes the step of generating the droplets of the treatment liquid by using a bifluid nozzle [(30), Fig. 12, col. 13, line 40] having: a casing [(32) which is the area between references (c) and (d), Fig. 12, col. 13, lines 43-47]; a liquid outlet port for discharging a

treatment liquid [(3), Fig. 12, col. 13, line 53]; and a gas outlet port for discharging a gas [space between (32) and (33) as well as space between (34) and above (3), Fig. 12, col. 13, lines 43-53]; whereto the bifluid nozzle is adapted to introduce the treatment liquid and the gas into the casing [col. 13, lines 63-67], generate the droplets of the treatment liquid by spraying the gas discharged from the gas outlet port over the treatment liquid discharged from the liquid outlet port outside the casing [the droplets form outside of casing (32) to the left of reference (c)], and the spout the droplets on the surface of the substrate [Fig. 12, col. 13, lines 40-67; col. 14, lines 1-33].

Furthermore, even if the reference to Kanno is removed from the scope of 35 U.S.C. 102 (b) rejection with regard to claims 3 and 4, one skilled in the art still obviously will come to the gas supply pressure, which corresponds to the gas amount and, therefore, gas flow rate as claimed in order to produce liquid droplets of about 10  $\mu\text{m}$  while supplying a treatment liquid into the cleaning jet nozzle of Kanno at the rate of about 100ml/min.

**8. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno in view of Izumi et al. (U.S. PGPub 2003/0170988).**

Claim 25: Kanno teaches the limitations of claim 1 above. Kanno teaches generating droplets of pure water [reads on “deionized water” in claim 25; col. 20, lines 3-5 and 45-46] by mixing the treatment liquid with a gas [col. 7, lines 3-14], but Kanno does not explicitly teach the type of gas used in the bi-fluid nozzle. However, Izumi teaches a similar method for treating a substrate using a pressurized gas consisting of Nitrogen [page 2, paragraph 26, lines 3-5]. Thus, it would have been obvious to a person of ordinary skill in the art to use the gas disclosed by Izumi in an attempt to provide an improved method for treating substrates, as a person with

ordinary skill has good reason to pursue the known options within his or her technical grasp. In turn, because the method of cleaning as claimed has the properties predicted by the prior art, it would have been obvious to use the nitrogen gas disclosed by Izumi in the nozzle of Kanno.

**9. Claims 1 and 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Izumi et al. (U.S. PGPub 2003/0170988) as evidenced by Kanno.**

Claims 1 and 3-4: Izumi teaches a substrate treatment method comprising generating droplets of a treatment liquid by mixing the treatment liquid with compressed air in a bi-fluid nozzle; impinging the droplets on a surface of the substrate, wherein the flow rate of the compressed air introduced into the bi-fluid nozzle is 50 to 100 ml/min [page 9, paragraph 131, lines 4-6], and the flow rate of the treatment liquid introduced into the bi-fluid nozzle is 100 to 150 ml/min [page 9, paragraph 131, lines 6-8].

Izumi also teaches that the droplet generating step includes the step of generating the droplets of the treatment liquid by using a bifluid nozzle [(68), Fig. 2, page 2, paragraph 33; page 4, paragraph 60] having: a casing [(34 and 39), Fig. 2, page 4, paragraph 61]; a liquid outlet port for discharging a treatment liquid [(39a), Fig. 2, page 4, paragraph 62]; and a gas outlet port for discharging a gas [(34a), Fig. 2, page 4, paragraph 62]; whereto the bifluid nozzle is adapted to introduce the treatment liquid [(37c), Fig. 2] and the gas into the casing [(37d), Fig. 2, page 4, paragraph 63], generate the droplets of the treatment liquid by spraying the gas discharged from the gas outlet port over the treatment liquid discharged from the liquid outlet port outside the casing, and the spout the droplets on the surface of the substrate [Fig. 2, pages 4-5, paragraphs 61-65].

Izumi teaches that the droplets of the treatment liquid provided under such conditions each had a diameter of about 5 to about 20  $\mu\text{m}$  [page 9, paragraph 131]; however, Izumi does not explicitly teach the claimed diameter size. However, Kanno teaches that a median diameter size for droplets of about 10  $\mu\text{m}$  [col. 14, lines 22-30] is conventionally known in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the median diameter, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

**10. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Izumi in view of Kanno.**

Claim 25: Izumi teaches the limitations of claim 1 above. Izumi teaches that the treatment liquid is water [page 4, paragraph 63] and the gas mixed with the treatment liquid is nitrogen [page 2, paragraph 26, lines 3-5]. Izumi does not explicitly teach that the water is deionized water. However, Kanno teaches that the treatment liquid in a bi-fluid nozzle when mixed with a gas is pure water [reads on “deionized water” in claim 25; col. 20, lines 3-5 and 45-46]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the pure water disclosed by Kanno for the water taught by Izumi because Kanno teaches that pure water is used for surface treating semiconductors when mixed with a gas.



***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICOLE BLAN whose telephone number is (571)270-1838. The examiner can normally be reached on Monday - Thursday 8-5 and alternating Fridays 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nicole Blan/  
Examiner, Art Unit 1792

/Michael Cleveland/

Supervisory Patent Examiner, Art Unit 1792